

# Wave Prediction by using Support Vector Regression, Study Case in Jakarta Bay

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## Abstract

Prediction of wave conditions is necessary for coastal and offshore operations, naval navigation, and harbor activities. The prediction is usually obtained by using traditional semi-empirical methods and numerical approaches by using wave models. In this paper, we use a soft computing approach for predicting wave condition, i.e. the Support Vector Regression (SVR), based on wind information as input for the regression model. Because of the limitation of wind and wave measurement data, here we use wind data obtained from the ECMWF ERA-5 and wave simulated data based on the SWAN model, as training data for the SVR model. As a study case, we choose an area with rather complex geometry and bathymetry, i.e. an archipelago country consisting of small islands; the Jakarta Bay, in Indonesia. We investigate the effect of wind input points concerning the obtained wave prediction. Results of the SVR approach are analyzed qualitatively by comparing with wave data as well as quantitatively by using correlation coefficient and RMSE. The results show a good agreement with wave data.

**Keywords:** Wave Prediction, Support Vector Regression, SWAN model

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